

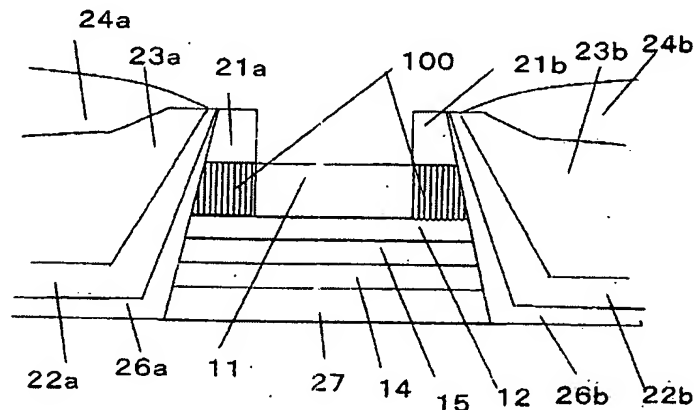
REMARKS/ARGUMENTS

Claim 1 is amended by this response. Claims 19-20 are canceled. No claims are added. Accordingly, following entry of these amendments and remarks, claims 1-6 and 17-18 will remain pending for Examination.

In the latest office action, the Examiner objected to the title. The title has now been amended in the manner suggested by the Examiner in order to overcome the objection.

The Examiner also objected to the disclosure. The disclosure has been amended in the manner suggested by the Examiner in order to overcome the objections.

Embodiments in accordance with the present invention relate to composite magnetic heads. For example, Fig. 6 (reproduced below) of the instant application shows: (1) first electrode layers 21a, 21b disposed on non-magnetic regions 100 of anti-ferromagnetic layer 11; and (2) magnetic domain layers 22a, 22b disposed on ends of a stack of layers consisting of first ferromagnetic layer 14, non-magnetic layer 15, second ferromagnetic layer 12, anti-ferromagnetic layer 11, and first electrode layers 21a, 21b.



The stack of layers are located so as to cover the respective ends of anti-ferromagnetic layer 11 and second ferromagnetic layer 12 and disposed to make a distance between adjacent magnetic domain control layers 22a, 22b to a certain size (§[0040]); and non-magnetic regions 100 are implanted into an anti-ferromagnetic layer 11:

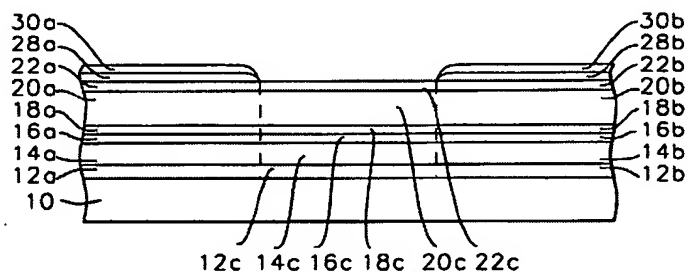
impurities may be implanted into the anti-ferromagnetic layer for eliminating the magnetic property of the anti-ferromagnetic layer at the electrode overlaid portions.
(Emphasis added; §[0057])

Pending independent claim 1 accordingly recites in part as follows:

1. A composite magnetic head comprising:
... an anti-ferromagnetic layer having non-magnetic regions on both ends thereof;
first electrode layers disposed respectively on the non-magnetic regions of the anti-ferromagnetic layer;
magnetic domain control layers disposed respectively on the ends of a stack of layers consisting of the first ferromagnetic layer, the non-magnetic layer, the second ferromagnetic layer, the anti-ferromagnetic layer, and the first electrode layers;
... wherein a width in a track width direction between the first electrode layers is smaller than a width in a track width direction of the first ferromagnetic layer. (Emphasis added)

Claims 1-6 and 17-18 were rejected as obvious based upon U.S. Patent No. 6,383,574 to Han et al. ("the Han patent"). These obviousness claim rejections are overcome as follows.

The Han patent describes a magnetoresistive (MR) layer different from that of the claimed invention. Specifically, as shown and described in connection with Figure 4 (reproduced in part below):



In the latest office action, the Examiner refers to cap layers 22a and 22b as the claimed first electrode layer, magnetic pinning layer 20 as the claimed anti-ferromagnetic layer, and ferromagnetic free layer 14a and 14b as the claimed first ferromagnetic layer. However, the Han patent does not teach or suggest that cap layers 22a, 22b are disposed on non-magnetic regions of the anti-ferromagnetic layer.

In particular, the Han patent lacks any teaching that describes the ion implanted portions of the magnetic pinning layer 20a and 20b of magnetic pinning layer 20 (the alleged anti-ferromagnetic layer in the Han patent) as non-magnetic regions. The Han patent merely discloses non magnetic conductor spacer layers 16a and 16b, which are not equivalent to "an anti-ferromagnetic layer having non-magnetic regions on both ends thereof" as recited in independent claim 1.

Furthermore, the Han patent fails to teach or suggest:

. . . magnetic domain control layers disposed respectively on the ends of a stack of layers consisting of the first ferromagnetic layer, the non-magnetic layer, the second ferromagnetic layer, the anti-ferromagnetic layer, and the first electrode layers . . .

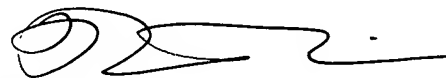
as recited in independent claim 1.

The Han patent merely shows the bias layer 28 (the alleged magnetic domain layers in the Han patent) disposed on the entire stack of layers including the first ferromagnetic layer, the non-magnetic layer, the second ferromagnetic layer, the anti-ferromagnetic layer, and the first electrode layer. The Han patent is silent as to bias layers 28 being disposed on the ends of a stack of layers. The placement of the alleged magnetic domain layers in the Han patent is completely different from the magnetic head configuration of the claimed invention.

Based at least upon the failure of the Han patent to teach or even suggest each of the elements of the pending claims, it is respectfully asserted that no conclusion of obviousness can reasonably be drawn from this reference. Continued rejection of the pending claims is therefore improper, and the claim rejections should be withdrawn.

In view of the foregoing, Applicant believes all claims now pending in this Application are in condition for allowance and an action to that end is respectfully requested. If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,



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